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INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 6 :  
H04M 3/42

A1

(11) International Publication Number:

WO 98/42115

(43) International Publication Date: 24 September 1998 (24.09.98)

(21) International Application Number: PCT/FI98/00089

(22) International Filing Date: 28 January 1998 (28.01.98)

(30) Priority Data: 971114 17 March 1997 (17.03.97) FI

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(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, GW, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG).

Published

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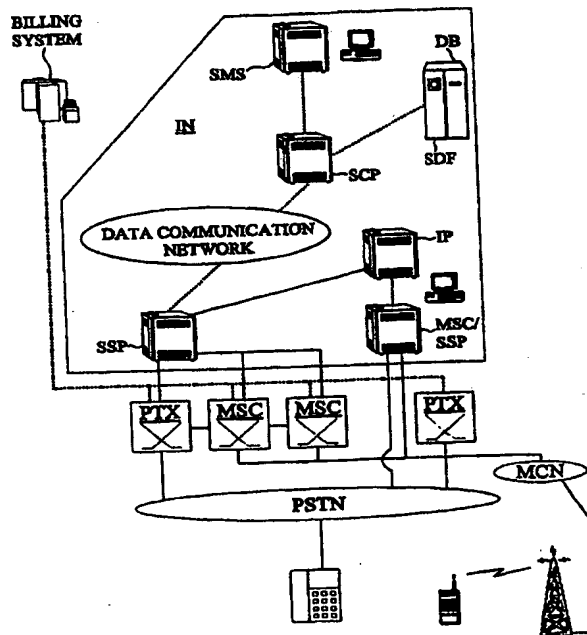
Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.

In English translation (filed in Finnish).

(54) Title: METHOD FOR PRODUCING A SERVICE PROFILE BASED ON USER'S CHOICE FOR AN EXTENSION IN A TELECOMMUNICATIONS NETWORK

(57) Abstract

The present invention relates to a procedure for creating a service profile dependent on the user's selection for a subscription in a telecommunication network. The invention makes it possible to use a subscription in a telecommunication network with several different subscriber numbers, each number being associated with an optional service profile dependent on the user's selection.



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METHOD FOR PRODUCING A SERVICE PROFILE BASED ON USER'S  
CHOICE FOR AN EXTENSION IN A TELECOMMUNICATIONS NETWORK

The present invention relates to a procedure  
5 for creating a service profile dependent on the user's  
selection for a subscription in a telecommunication  
network. The invention makes it possible to use several optional telephone numbers to utilise a telecommunication network subscription, each number being associated with an optional service profile dependent on  
10 the user's selection.

In prior art, call setup in a telecommunication network is usually based on a number selection made by the calling subscriber, in other words, the  
15 calling subscriber selects via his/her terminal an address, i.e. the number of the called subscription, on the basis of which the switching and exchange system connects the calling subscriber's selection to the called subscriber.

Previously known is also a terminal-dependent  
20 and/or network-dependent "Dual numbering" solution used in the DCS system (Digital Cellular System). In this case, the DCS telephone has two numbers and the user can select which one of them is to be active. On  
25 the other hand, when receiving a call, the user can see which one of the lines is being used. A problem with this solution is that it is dependent on the terminal and/or network, i.e. it can only be utilised by using DCS terminals. Moreover, to implement this solution,  
30 changes are required in the mobile communication switching centre.

The object of the present invention is to reduce the problems described above and to produce a new procedure for creating a user selectable service profile  
35 file for a telecommunication network subscription, a

procedure that is independent of the telecommunication network and/or terminal.

In the procedure of the invention, a subscription in the telecommunication network is given several subscriber numbers, i.e. an optional number of  
5 subscriber numbers. When different subscriber numbers are used, the A-ID used in call signalling, i.e. the A-number or the caller's telephone number displayed at the receiving end, will be different for each call,  
10 depending on the user's selection.

Thus, the user of a subscription can selectively decide for each call which subscriber identity, i.e. A-ID, is to be sent to the receiver and/or charged. Correspondingly, when calls are made to these  
15 different subscriber numbers, the caller's A-ID will be displayed differently depending on which one of the subscriber numbers is being called.

For the subscriber numbers, i.e. subscriber identities associated with a subscription, different service profiles can be created. Such services bound  
20 to a given optional subscriber identity may include e.g. a "call screening" function, different invoicing, a so-called permanent-number service and/or suppression of calling number, and so on.

The procedure of the invention allows the user to be given an optional number of subscriber numbers, each associated with an optional service profile depending on the user's selection. To make a call via  
25 a subscription according to the invention, the user will normally dial either a mere B-number, i.e. the desired receiver number, and/or a given identifier before the B-number. In the latter case, the system automatically changes the A-ID to be sent, depending on the identifier selected by the user. In the incoming  
30 direction, the system changes the A-ID by adding before it the same identifier that is used when making a call using the telephone number concerned. On the ot-

her hand, when a call is made to a physical number, the call will be given no special treatment but the number is displayed directly as such.

The present invention provides the advantage  
5 that the procedure can be used regardless of the telephone system and/or terminal. It is only required that the terminal have a display for displaying the caller's number and/or that it permits the entry of above-decadal characters. The network is required to  
10 provide signalling support for the transmission of the caller's number. In practice, the A-ID is currently always signalled in mobile communication and in wired networks when the subscription is a digital one. In the near future, a new service allowing calling-number  
15 display will be introduced in the NMT-900 (Nordic Mobile Telephone) network as well.

The special features characteristic of the procedure of the invention are presented in the description of the invention and in the claims to follow.  
20

In the following, the invention will be described in detail by referring to the attached drawings.

Fig. 1 presents an example of making and/or  
25 receiving a call with an alternative subscriber number.

Fig. 2 presents an example of making and/or receiving a call with a physical subscriber number.

Fig. 3 presents a signalling diagram illustrating the way a call is made and/or received with an  
30 alternative subscriber number in an embodiment of the invention utilising an intelligent network.

Fig. 4 presents an example of implementing an intelligent network that can be utilised in an embodiment of the procedure of the present invention.  
35

The examples in Fig. 1 and/or Fig. 2 illustrate a service comprising only two subscriber num-

bers, but the service may comprise an optional number of subscriber numbers. They only have to be distinguished using different identifiers. In Fig. 1, calls are made and/or received using the subscriber's alternative subscriber number. The identifier or asterisk \* in Fig. 1 represents an identifier that is fed into the telephone and detected when calls are received. This identifier may be any kind of symbol, depending on the capabilities of the telephone exchange. It may be e.g. an optional row of figures and/or it may contain above-decadal characters, such as asterisk, square, etc.

Fig. 3 shows a signalling diagram representing the way in which a call is made and/or received with an alternative subscriber number in an embodiment of the invention utilising an intelligent network. In a preferred embodiment of the procedure of the invention, existing network elements and/or a register and control unit, such as e.g. an intelligent network register, are utilised in a new way. In the intelligent network, a separate database register is provided for each A-subscription, in which the alternative subscriber numbers for the particular subscription are stored. According to Fig. 3, when the user makes and/or receives a call with an alternative subscriber number, control of the call is handed over to the intelligent network, the information in the intelligent network database is modified and the new identity is included in the signalling in the telephone network.

The system of the invention comprises a call connection and control component, a database component and a service management system. In a preferred embodiment, these are network elements consistent with the intelligent network architecture IN: SSP (Service Switching Point), SCP Service Control Point, SDP (Service Data Point, intelligent network database) and SMS (Service Management System). They need not be se-

parate devices but they can be integrated with each other, depending on the implementation of the intelligent network. An IP (Intelligent Peripheral) may be connected to the SSP and/or MSC (Mobile Switching Centre). The SDP may be comprised in the SCP. In an embodiment, the SCP may comprise a SDF (Service Data Function) and/or a DB (Database). A more comprehensive idea of intelligent networks can be obtained from ITU-T recommendations Q.121X or Bellcoren AIN recommendations.

In addition, the system is connected to public telecommunication networks, such as the PSTN (Public Switched Telecommunications Network) and/or mobile communications networks MCN, which comprise telephone exchanges, such as e.g. GSM (Global System for Mobile Communications) and/or PSTN PTX (Public Telephone Exchange) exchanges, to which the subscribers are connected. Calls are connected to the SSP of the service according to selection, based on an analysis of the called subscriber number. When a call is made by entering an optional identifier before the telephone number, i.e. before the called-subscriber number, the telephone exchange will automatically route all calls made with that identifier to the switching point regardless of the telephone number.

The service switching point and the subscriber's telephone exchange may physically belong to the same system. In an embodiment, the MSC may be provided with intelligent network SSP functions.

The decisions regarding the routing of calls may also be made using a subscriber-specific ICK (IN Category Key), in which case only calls dialled with a certain identifier by subscribers who have joined the service, not all calls dialled with that identifier, will be routed to the IN switching point of the service.

In a preferred embodiment of the procedure of the invention, a user of a subscriber line in the telecommunication network can be assigned different numbers and/or service profiles e.g. for duty calls and  
5 for private calls. For example, the invention allows easier monitoring of the billing of calls made by an employee from a company-owned mobile telephone, because the user of the subscription can make off-duty calls using an alternative number of the same  
10 subscription. If necessary, the alternative numbers of a subscription can be associated with different service profiles than the physical subscriber number, so that, for instance, a given alternative number is associated with e.g. inhibition of certain calls, suppression of calling number, special rates and similar  
15 optional services.

Thus, by making a selection, i.e. by entering a given identifier before the called-subscriber number, the user is able to achieve an optional service  
20 profile and/or to use several different subscriber numbers with the same telecommunication network subscription, i.e. with the same SIM (Subscriber Identity Module) and/or telecommunication network terminal.

25 On the other hand, when receiving calls, the user of a subscription can see from the new type of number display which one of the subscription numbers is receiving the call, i.e. whether it is a duty call or a private call. If the number of the incoming call  
30 is not preceded by an identifier for an optional number, then the call will be connected to the normal physical subscriber number, in which case the number of the incoming call is displayed as such.

In the foregoing, the invention has been  
35 described by only describing some of its preferred embodiments. However, this is by no means to be regarded as limiting the invention exclusively to the examples



presented. It is obvious to the person skilled in the art that many variations, complementary additional features and/or alternative solutions are possible within the scope of the inventive idea defined by the  
5 following claims.

7a

## ANNEX

In Figs. 1 and 2: the asterisk \* represents an identifier, i.e. it is not a code to be used.

5

In Fig. 3:

**NETWORK ELEMENTS**

MS (Mobile Station) means telephone subscription (e.g. mobile telephone)

MSC (Mobile Switching Centre) means the caller's telephone exchange (e.g. GSM switching centre)

SSP/SCP (Service Switching Point/Service Control Point) means a unit for the switching and control of services (e.g. intelligent network structure)

SDP (Service Data Point) means the database used by the service (e.g. intelligent network structure)

**MESSAGES**

Initial Address message initiates call from telephone

Getting New Calling Number message is a request to return a new calling number by giving the old AId and an identifier

New Aid message returns an alternative calling number for the subscriber

Getting New Called Number message is a request to return the subscriber's physical subscriber number for the routing of the call to the telephone (old called number as input data)

New Called Number message returns the physical subscriber number of the subscription

7b

IAI means Initial Address with additional Information (TUP)

ANU, ANswer-Unqualified is a message indicating that the called subscriber is answering (TUP)

5 CLF, CLear Forward is a call setdown message (TUP)

=> Disconnection of the call is detected when the SSP receives a CLF message in accordance with TUP

CLF means Clear Forward, i.e. a message sent when the call is disconnected.

10

In Fig. 4:

15      ..... telecommunication network signalling  
         ——— voice and/or signalling  
         ..... control and or operation signalling

20

## CLAIMS

1. Procedure for creating a service profile dependent on the user's selection for a subscription in a telecommunication network, in which procedure

5 a subscriber-specific database (SDP) is created in the telecommunication network, preferably an intelligent network, in which database is stored an optional number of subscriber numbers, i.e. calling subscriber's numbers, each associated with an optional  
10 service profile,

a call is directed to a service switching/control point (SSP/SCP) after a call number analysis of the subscription concerned has been performed in the telecommunication network exchange (MSC, PTX),

15 characterised in that, for outgoing calls, a new A-ID for the caller is fetched from the database (SDP), to be used as an equivalent for the old A-ID, i.e. the physical subscriber number, and/or for an identifier associated with an optional subscriber number and entered by the user of the subscription,  
20 on,

whereupon the new A-ID is activated for the subscription and included in the signalling in the telecommunication network, in other words, the system  
25 automatically changes the A-ID to be sent, in accordance with the identifier selected by the user,

when calls addressed to an alternative subscriber number are received, a new called-subscriber number, i.e. physical subscriber number  
30 corresponding to the old called-subscriber number is fetched from the database (SDP),

whereupon the call is connected based on the new called-subscriber number, i.e. physical subscriber number,

and the A-ID is modified by adding in front of it the same identifier that is used when making calls with the optional subscriber number in question.

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*Subscriber using  
the solution of  
the invention*

*The other party*

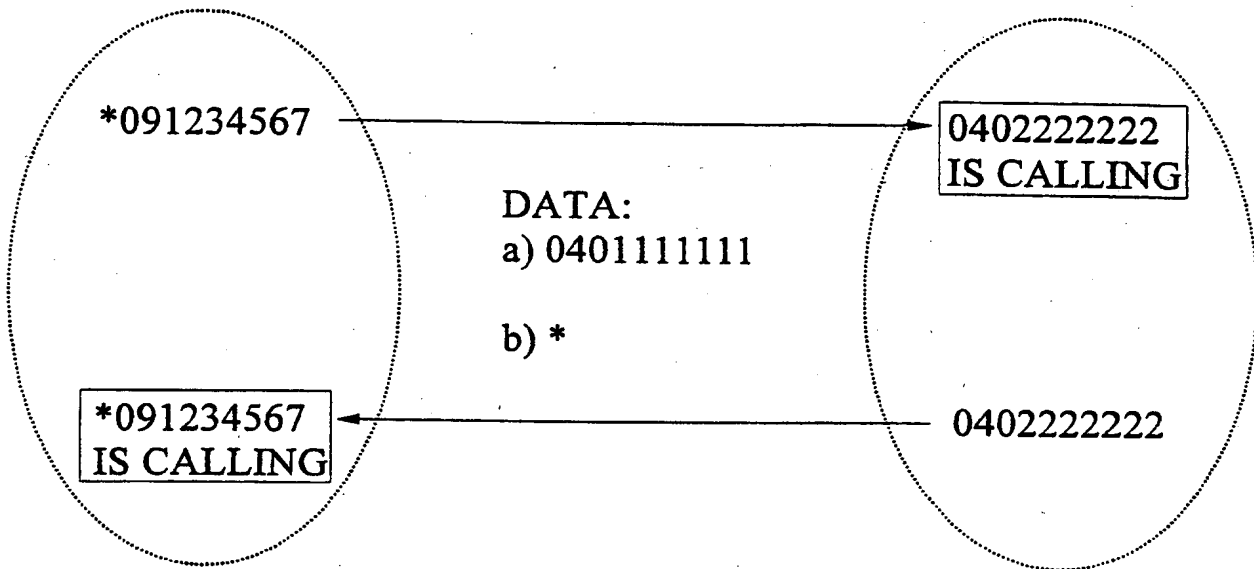


Fig. 1

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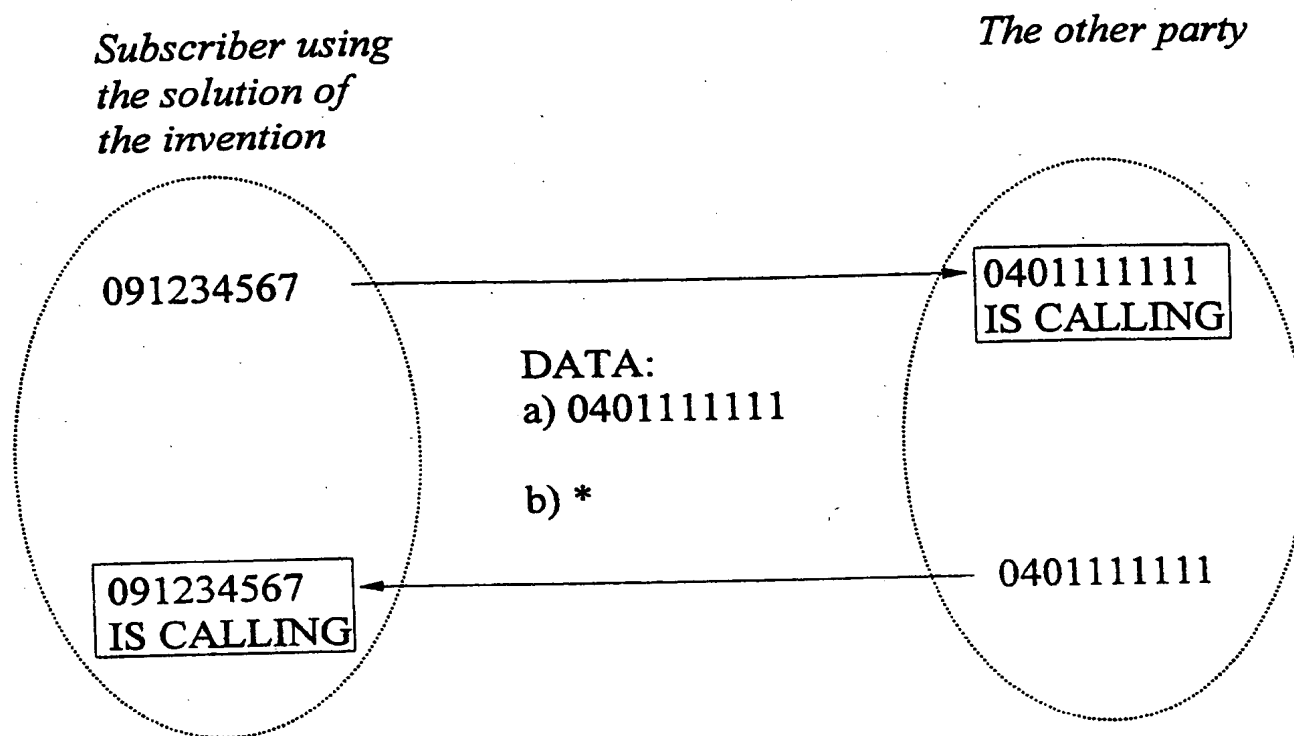


Fig. 2

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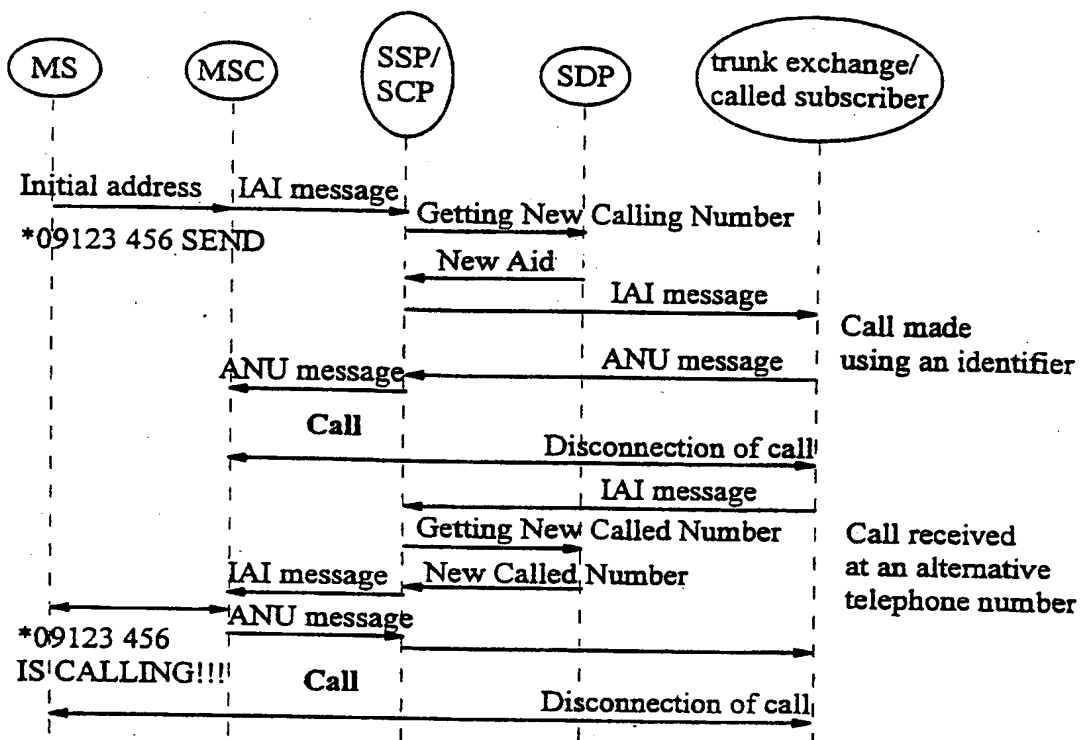


FIG. 3



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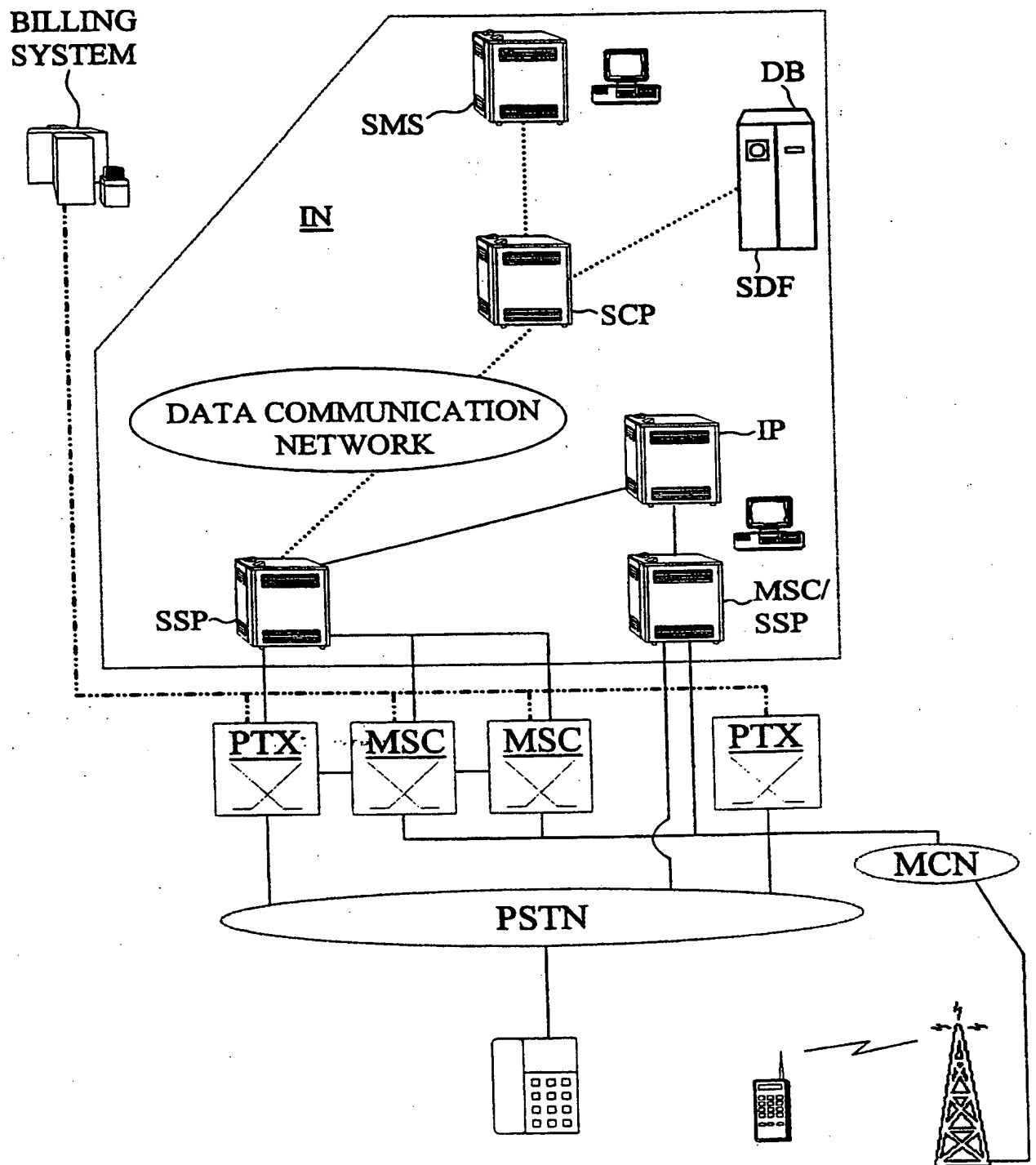


Fig. 4

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/FI 98/00089

## A. CLASSIFICATION OF SUBJECT MATTER

IPC6: H04M 3/42

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC6: H04M, H04Q

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

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## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 9316549 A1 (MOTOROLA, INC.), 19 August 1993 (19.08.93), page 4, line 1 - line 13, see the claims --	1
A	GB 2280334 A (MITEL CORPORATION), 25 January 1995 (25.01.95), page 2, line 7 - page 4, line 31 --	1
P,A	WO 9748243 A2 (NOKIA TELECOMMUNICATIONS OY), 18 December 1997 (18.12.97), page 1, line 31 - page 2, line 26 -- -----	1

☐ Further documents are listed in the continuation of Box C.☒ See patent family annex.

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Date of mailing of the international search report

17 -07- 1998

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9316549 A1	19/08/93	BR 9304158 A	02/08/94
		CA 2105966 A,C	07/08/93
		CN 1076817 A	29/09/93
		CN 1109253 A	27/09/95
		CZ 9302091 A	19/10/94
		FR 2687875 A,B	27/08/93
		GB 2271040 A,B	30/03/94
		IT 1261762 B	03/06/96
		IT RM930066 D	00/00/00
		JP 6507059 T	04/08/94
		MX 9300641 A	01/09/93
GB 2280334 A	25/01/95	CA 2100699 A,C	17/01/95
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		GB 9413303 D	00/00/00
		US 5703942 A	30/12/97
WO 9748243 A2	18/12/97	AU 2965497 A	07/01/98
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